

CLAIMS

The invention is claimed as follows:

5 1. An auto-rack railroad car supplemental restraint for an auto-rack railroad car having a primary restraint system for a vehicle, said primary restraint system including a grating and a primary restraint adapted to be releaseably attached to the grating, said supplemental restraint comprising:

10 a body adapted to be positioned on the grating between a tire of the vehicle on the grating and the primary restraint, said body including a mounting member and a tire engager extending upward from the mounting member; and

15 an expander connected to the body, said expander movable to a non-expanded position and at least one expanded position, wherein the positioning of the expander in the expanded position is adapted to cause the tire engager to engage the tire and the expander to engage the primary restraint.

20 2. The supplemental restraint of Claim 1, wherein the tire engager is formed with a curvature for engaging the tire.

3. The supplemental restraint of Claim 1, wherein the mounting member and the tire engager are integrally formed.

25 4. The supplemental restraint of Claim 1, which includes a pad attached to a bottom of the mounting member.

5. The supplemental restraint of Claim 1, wherein the expander includes a base connected to the tire engager.

30 6. The supplemental restraint of Claim 5, wherein the expander includes an expanding member movably connected to the base and adapted to move to the non-expanded position and the expanded position.

7. The supplemental restraint of Claim 6, which includes at least one handle connected to the expanding member.

8. The supplemental restraint of Claim 6, wherein the expander includes a locking mechanism operable to releasably lock the expanding member in the expanded position.

9. The supplemental restraint of Claim 8, wherein the locking mechanism includes a spring loaded plunger.

10. The supplemental restraint of Claim 6, wherein the expander includes a guide mechanism operable to guide the movement of the expanding member relative to the base.

11. The supplemental restraint of Claim 1, wherein the expander is movable to at least one partially expanded position.

12. The supplemental restraint of Claim 1, wherein the expander includes a base and a movable expanding member biasingly connected to the base, wherein at least one locking notch is defined in one of the base and the expanding member, and a locking pin extends from the other of the base and the movable expanding member, wherein the locking notch and locking pin are adapted to releasably lock the movable expanding member relative to the base.

13. The supplemental restraint of Claim 1, wherein the expander includes a base and a movable expanding member biasingly connected to the base, said base and moveable expanding member including a releasable locking assembly adapted to releasably lock the movable expanding member relative to the base in each of a plurality of positions including the non-expanded position, the expanded position, and at least one partially expanded position.

14. The supplemental restraint of Claim 13, wherein the releasable locking assembly includes a locking pin and a plurality of locking receptacles each adapted to receive the locking pin, wherein the pin is attached to one of the base and expanding member and the locking receptacles are formed in the other of the base and expanding member.

15. The supplemental restraint of Claim 1, wherein the expander includes a base and a movable expanding member which is biasingly attached to the base.

16. An auto-rack railroad car supplemental restraint for an auto-rack railroad car having a primary restraint system for a vehicle, said primary restraint system including a grating and a primary restraint adapted to be releasably attached to the grating, said supplemental restraint comprising:

a body adapted to be positioned on the grating between a tire of the vehicle and the primary restraint, said body including a mounting member and a tire engager extending upwardly from the mounting member; and

expanding means for causing the tire engager to engage the tire, said expanding means movable between a non-expanded position and an expanded position, wherein the movement between the non-expanded position and the expanded position is adapted to cause the tire engager to securely engage the tire and the expanding member to engage the primary restraint.

17. The supplemental restraint of Claim 16, wherein the expanding means includes an expanding member biasingly connected to the tire engager.

18. The supplemental restraint of Claim 16, wherein the tire engager is formed with a curvature for engaging the tire.

19. The supplemental restraint of Claim 16, wherein the mounting member and the tire engager are integrally formed.

5 20. The supplemental restraint of Claim 16, which includes a pad attached to a bottom of the mounting member.

21. The supplemental restraint of Claim 16, which includes at least one handle connected to the expanding means.

10 22. The supplemental restraint of Claim 16, wherein the expanding means includes a locking mechanism.

23. The supplemental restraint of Claim 16, wherein the expanding means includes a guide mechanism.

15 24. The supplemental restraint of Claim 16, wherein the expander includes at least one partially expanded position.

25. An auto-rack railroad car supplemental restraint for an auto-rack railroad car having a primary restraint system for a vehicle, said primary restraint system including a grating and a primary restraint adapted to be releaseably attached to the grating, said supplemental restraint comprising:

5 a body adapted to be positioned on the grating between a tire of the vehicle and the primary restraint, said body including a mounting member and a tire engager connected to the mounting member, wherein the tire engager is formed with a curvature for engaging the tire;

10 an expander connected to the body, said expander including a base connected to the tire engager and an expanding member biasingly connected to the base, said expanding member movable to a non-expanded position and at least one expanded position, said expander including a locking mechanism operable to releasably lock the expanding member in each said expanded position, said expander including a guide mechanism operable to guide the
15 movement of the expanding member relative to the base, wherein the positioning of the expanding member in the expanded position is adapted to cause the tire engager to engage the tire; and

at least one handle connected to the expanding member.

20 26. The supplemental restraint of Claim 25, wherein the mounting member and the tire engager are integrally formed.

27. The supplemental restraint of Claim 17, which includes a pad attached to the bottom of the mounting member.

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28. An auto-rack railroad car supplemental restraint for an auto-rack railroad car having a primary restraint system for a vehicle, said primary restraint system including a grating and a primary restraint adapted to be releaseably attached to the grating, said supplemental restraint comprising:

5 a tire engaging member;

a primary restraint engaging member; and

an expander connected to the tire engaging member and the primary restraint engaging member, said expander operable to cause the movement of the tire engaging member and the primary restraint engaging member between a non-expanded position and at least one expanded position, wherein in the non-expanded position, the tire engaging member is closer to the primary restraint engaging member, and in the expanded position, the tire engaging member is further away from the primary restraint engaging member and wherein moving the supplemental restraint into the expanded position causes the tire engaging member to engage the tire.

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29. The supplemental restraint of Claim 28, wherein the tire engaging member is formed with a curvature for engaging the tire.

20 30. The supplemental restraint of Claim 28, which includes at least one handle connected to the expander.

31. The supplemental restraint of Claim 28, wherein the expander includes a locking mechanism operable to releasably lock the expander in the expanded position.

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32. The supplemental restraint of Claim 28, wherein the expander includes a guide mechanism operable to guide the movement of the expander.

30 33. The supplemental restraint of Claim 28, wherein the expander includes at least one partially expanded position.